09647265 - 110900

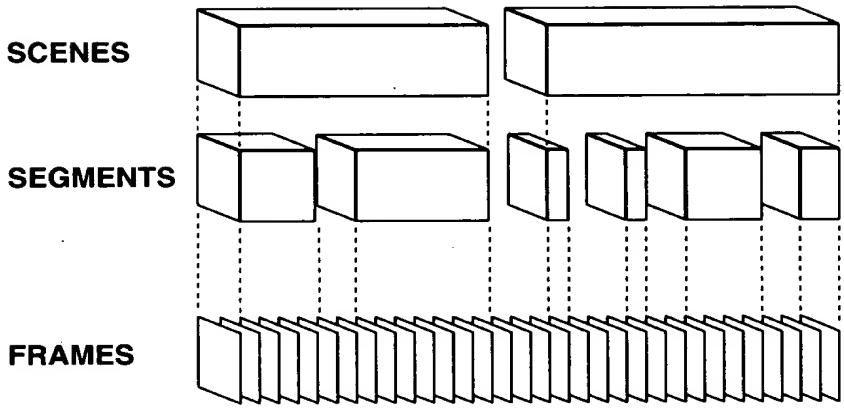

FIG.1

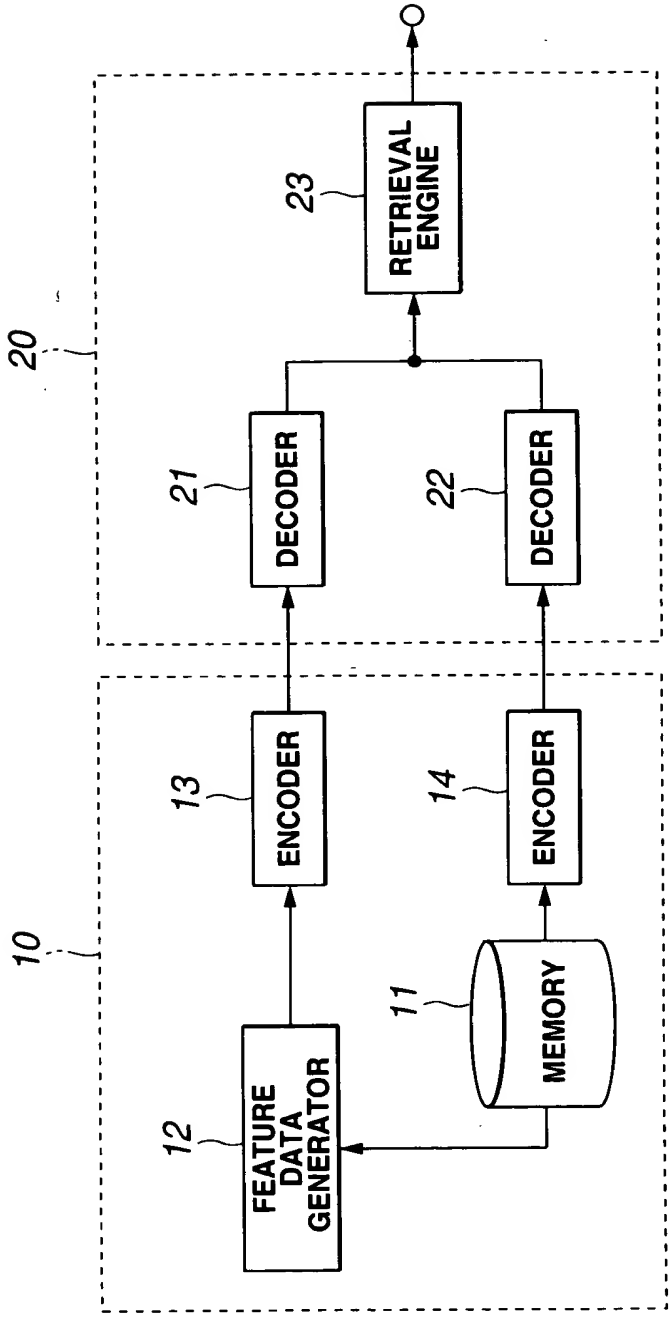
10
11
12
13
14
20
21
22
23
FEATURE DATA GENERATOR
ENCODER
ENCODER
MEMORY
DECODER
DECODER
RETRIEVAL ENGINE

FIG.2

09647265 - 092000

Descriptor		Superclass
Feature :	Type	Example Value
⋮	⋮	⋮

FIG.3

09/647265

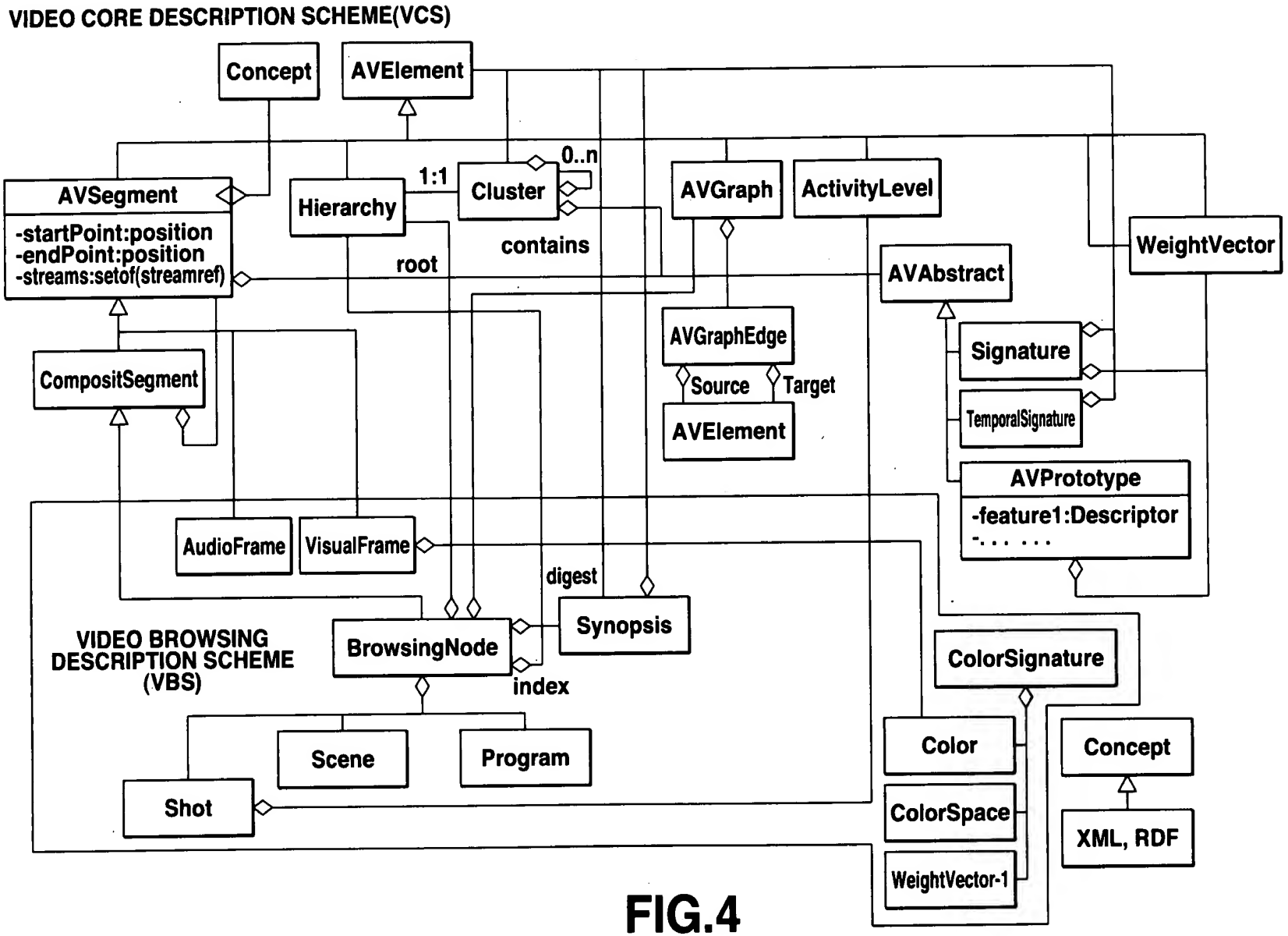

FIG.4

Descriptor : AVElement		Superclass : None
Feature :	Feature : Type	Example Value

FIG.5

Descriptor : AVSegment		Superclass : AVElement
Feature :	Feature Type	Example Value :
StartPoint	Position	
EndPoint	Position	
Streams	Streamref	
Abstract	Avabstract	Key frame
Concept	Concept	An RDF structure describing the content of this segment

FIG.6

09647265 : 110900

Descriptor : AVAbstract		Superclass : AVElement
Feature :	Feature Type	Example Value :

FIG.7

Descriptor : AVPrototype		Superclass : AVAbstract
Feature :	Feature Type	Example Value :
Kind	String	"Shot" "Scene" "VisualFrame"
Weights	WeightVector	
Feature1	Descriptor1	
Feature2	Descriptor2	
. . .	. . .	. . .
Featuren	Descriptorn	

FIG.8

09647265 - 111900

09647265.071600

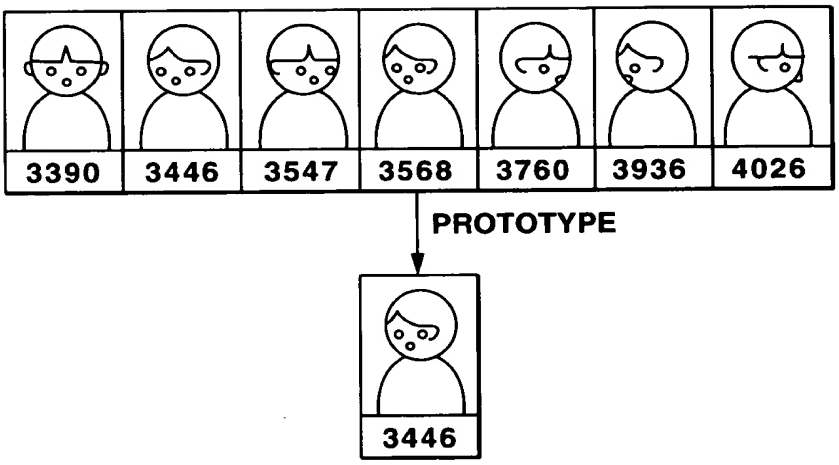

FIG.9

Descriptor : Hierarchy		Superclass : AVElement
Feature :	Feature Type	Example Value :
Root	Cluster	
Kind	String	

FIG.10

Descriptor : Cluster		Superclass : AVElement
Feature :	Feature Type	Example Value :
Members	AVElement	
Abstract	AVAbstract	

FIG.11

09647265 : 071000

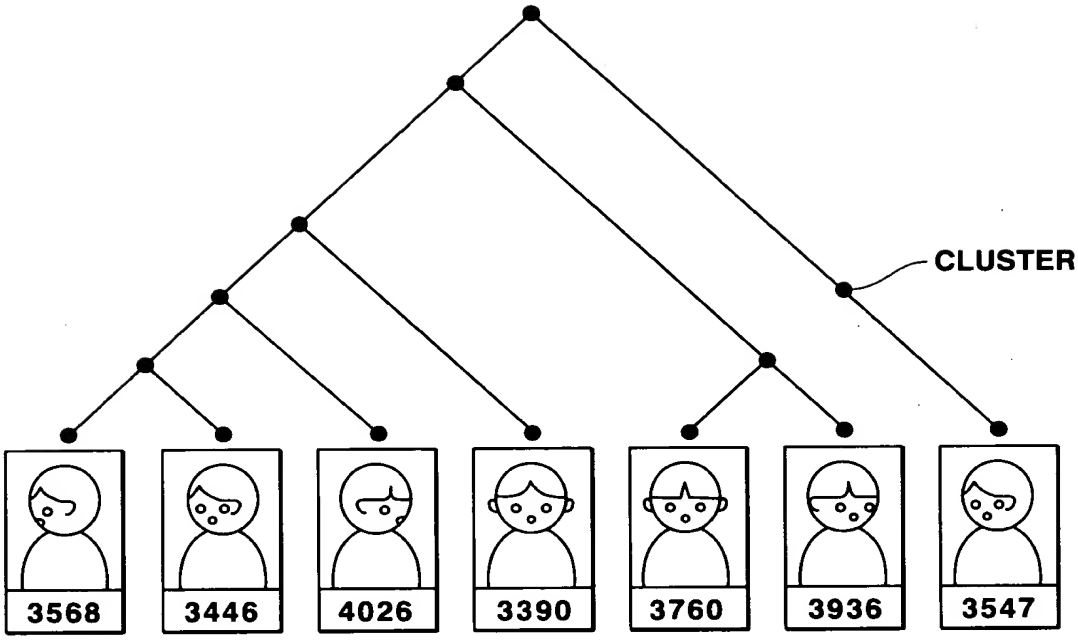

FIG.12

09647265 .052700

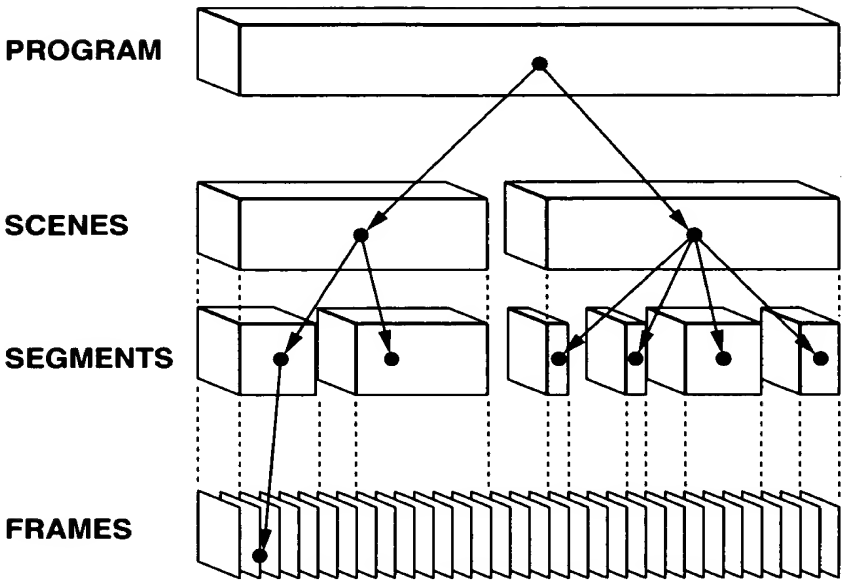

FIG.13

Descriptor: CompositeSegment		Superclass: AVSegment
Feature:	Feature Type	Example Value:
Components	AVSegment	

FIG.14

09647265 "09/647265"

0606745.950

Descriptor : AVGraph		Superclass : AVElement
Feature :	Feature Type	Example Value :
Edges	AVGraphEdge	
Kind	String	

FIG.15

0060TT"5927h960

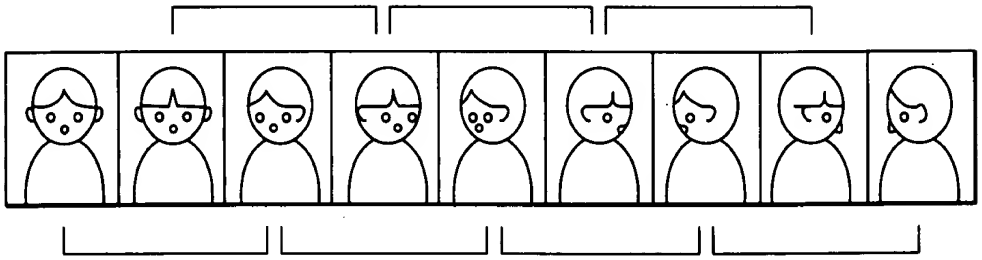

FIG.16A

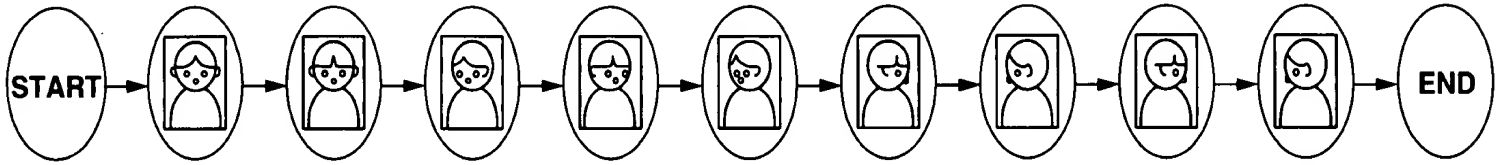

FIG.16B

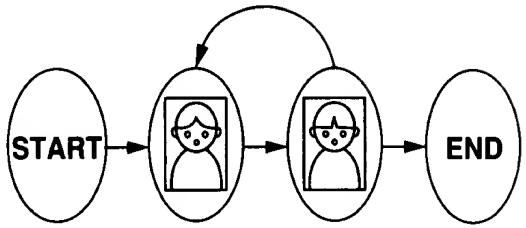

FIG.16C

09/647265

Descriptor : AVGraphEdge		Superclass : None
Feature :	Feature Type	Example Value :
Source	AVElement	
Target	AVElement	
Label	String	"follows" "similarTo"

FIG.17

Descriptor : Signature		Superclass : AVAbstract
Feature :	Feature Type	Example Value :
Weights	WeightVector	
Members	AVElement	
Kind	String	

FIG.18

DOCKET: 5025-4560

Descriptor : TemporalSignature		Superclass : AVAbstract
Feature :	Feature Type	Example Value :
Time	WeightVector	
Members	AVElement	
Kind	String	

FIG.19

Descriptor : ActivityLevel		Superclass : None
Feature :	Feature Type	Example Value :
ActivityLevel	Real	

FIG.20

0050714 5924768

Descriptor : WeightVector		Superclass : None
Feature :	Feature Type	Example Value :
Weights	Real[n]	
Normalized	Boolean	

FIG.21

Descriptor : Concept		Superclass : None
Feature :	Feature Type	Example Value :
Concept	RDFNode or XML or . . .	

FIG.22

09647265 - 090704

Descriptor : Synopsis		Superclass : AVElement
Feature : Concept	Feature Type	Example Value :
Kind	String	
Sequence	AVElement	
IsOrdered	Boolean	

FIG.23

Descriptor : Color		Superclass : None
Feature :	Feature Type	Example Value :
Color	Real[3]	

FIG.24

09647265 - 031205

Descriptor : ColorSpace		Super type : None
Feature :	Feature Type	Example Value :
ColorSpace	String	"HSV"

FIG.25

Descriptor : ColorSignature		Super type : None
Feature :	Feature Type	Example Value :
ColorSpace	ColorSpace	
Colors	Color[n]	
Weights	WeightVector	

FIG.26

09647265 .120501

Descriptor : AudioFrame		Superclass : AVSegment
Feature :	Feature Type	Example Value :

FIG.27

Descriptor : VisualFrame		Superclass : AVSegment
Feature :	Feature Type	Example Value :
Color	ColorSignature	

FIG.28

09647265 : 042505

Descriptor : BrowsingNode		Superclass : CompositeSegment
Feature :	Feature Type	Example Value :
Index	AVHierarchy	A classification of the shots in a video
Synopsis	AVSynopsis	Sequence of key frames
Structure	AVGraph	

FIG.29

Descriptor : Shot		Superclass : BrowsingNode
Feature :	Feature Type	Example Value :
Activity	ActivityLevel	"0.5"
Abstract	From AVSegment	
Synopsis	From BrowsingNode	
Index	From BrowsingNode	

FIG.30

09647265 - 110900

09647265 : 072600

Descriptor : Scene		Superclass : BrowsingNode
Feature :	Feature Type	Example Value :
Kind	String	"DIALOG" "COMMERICAL" "ACTION" "ANCHOR"
Abstract	From AVSegment	
Synopsis	From BrowsingNode	
Index	From BrowsingNode	
Structure	From BrowsingNode	

FIG.31

Descriptor : Program		Super type : BrowsingNode
Feature :	Feature Type	Example Value :
Abstract	From AVSegment	Kind : SCENE ABSTRACT SHOT ABSTRACT
Synopsis	From BrowsingNode	
Index	From BrowsingNode	
Structure	From BrowsingNode	

FIG.32

09647265 . 110900

09647265 : 110900

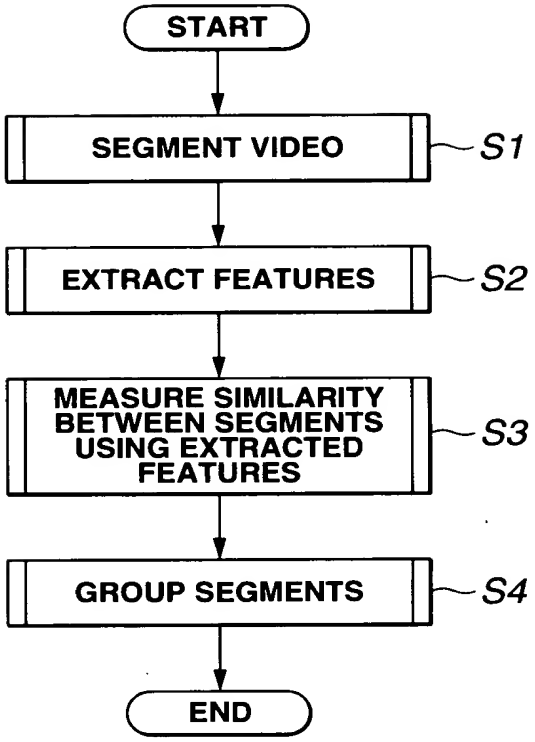

FIG.33

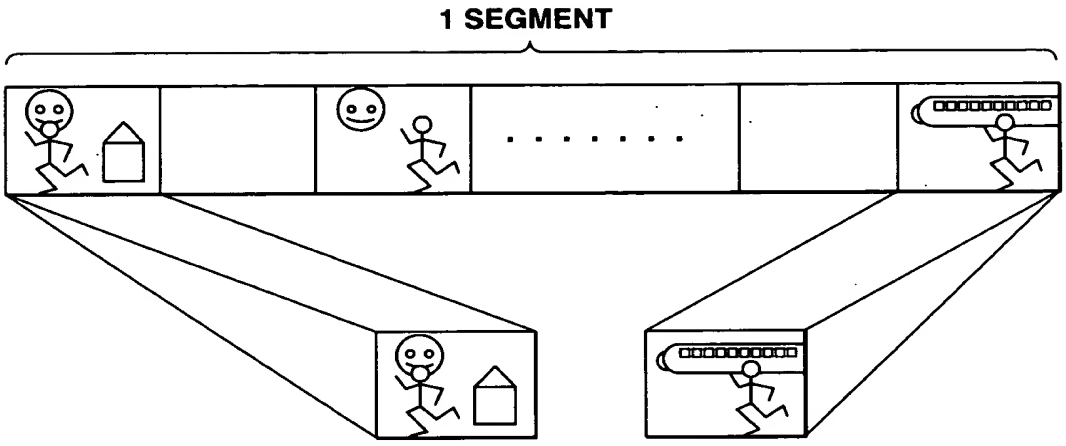

FIG.34

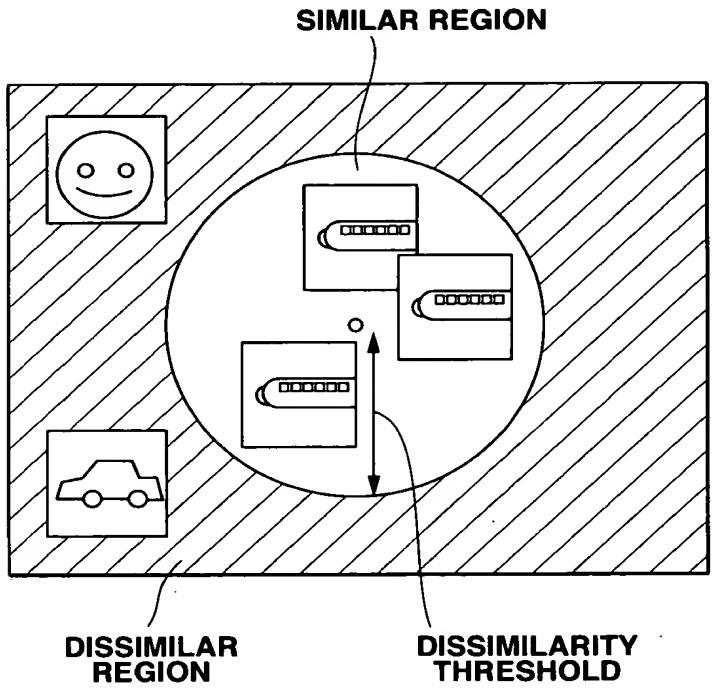

FIG.35

09647265 - 100900

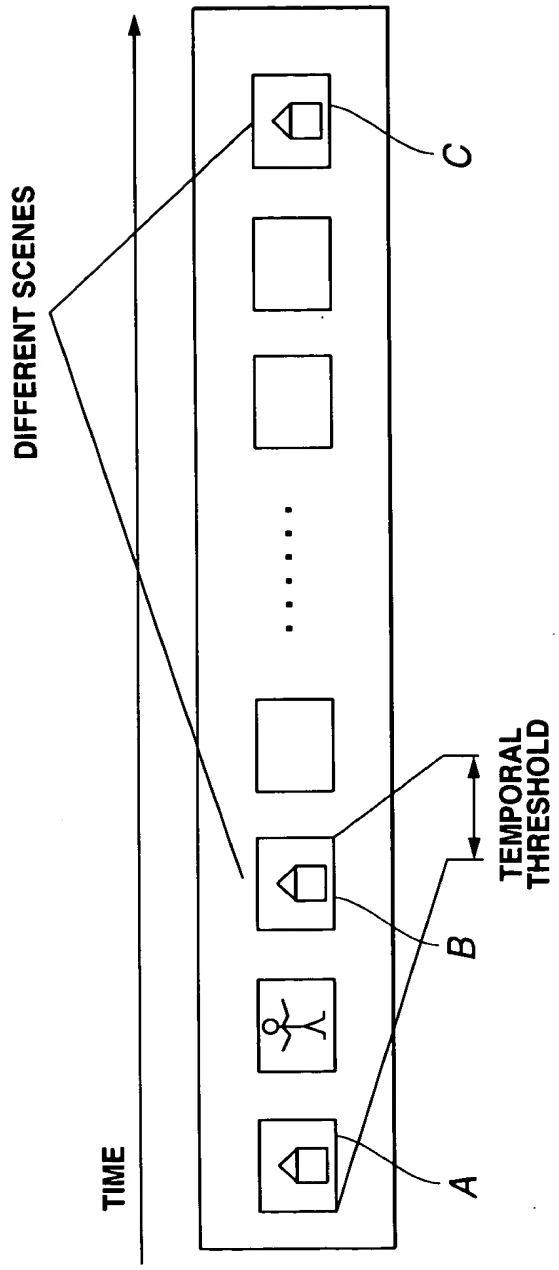

FIG.36

0960714-5024960

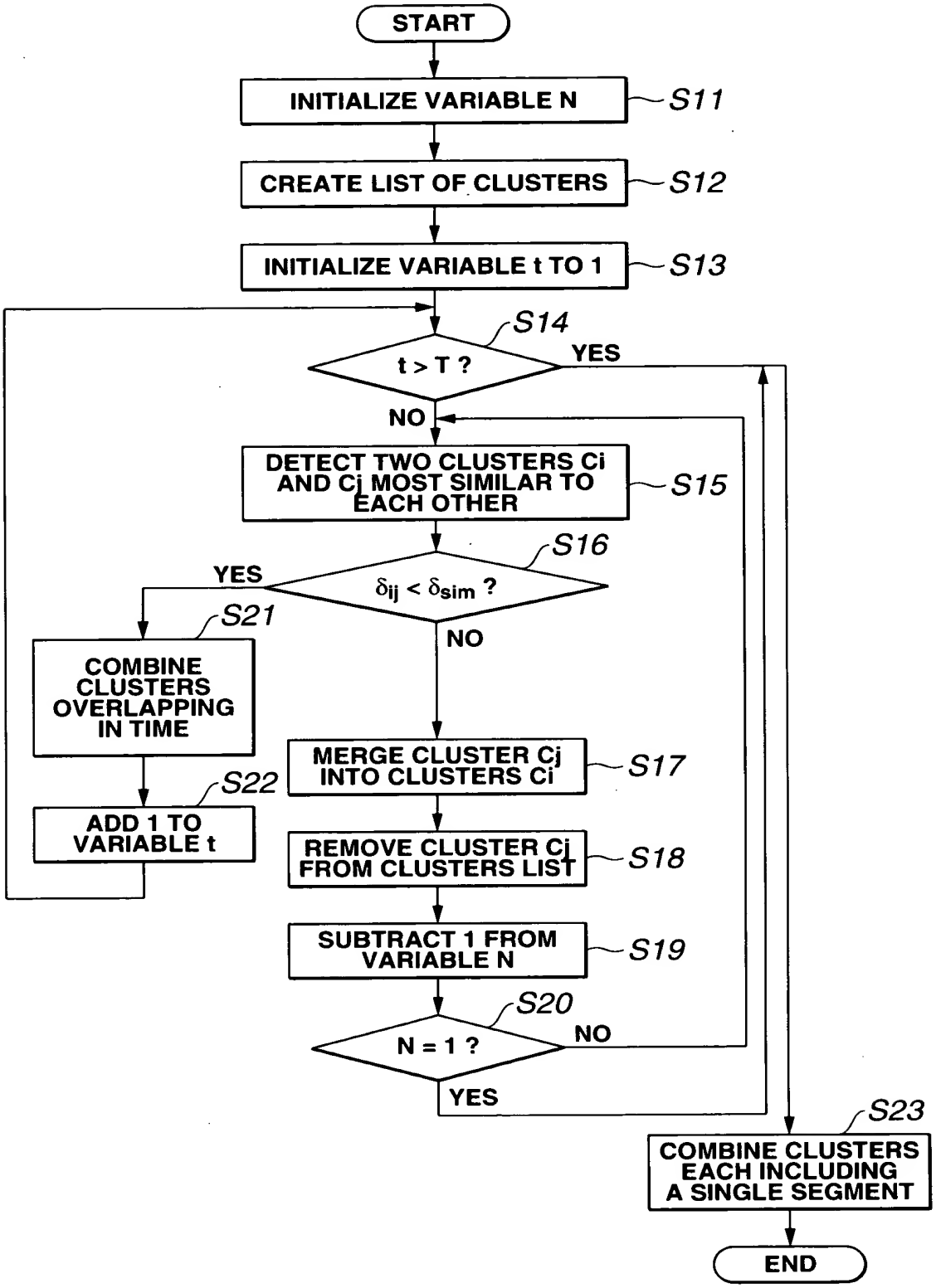
START
INITIALIZE VARIABLE N
S11
CREATE LIST OF CLUSTERS
S12
INITIALIZE VARIABLE t TO 1
S13
S14
t > T ?
YES
NO
DETECT TWO CLUSTERS Ci AND Cj MOST SIMILAR TO EACH OTHER
S15
S16
δij < δsim ?
YES
NO
S21
COMBINE CLUSTERS OVERLAPPING IN TIME
S22
ADD 1 TO VARIABLE t
MERGE CLUSTER Cj INTO CLUSTERS Ci
S17
REMOVE CLUSTER Cj FROM CLUSTERS LIST
S18
SUBTRACT 1 FROM VARIABLE N
S19
S20
N = 1 ?
NO
YES
S23
COMBINE CLUSTERS EACH INCLUDING A SINGLE SEGMENT
END

FIG.37

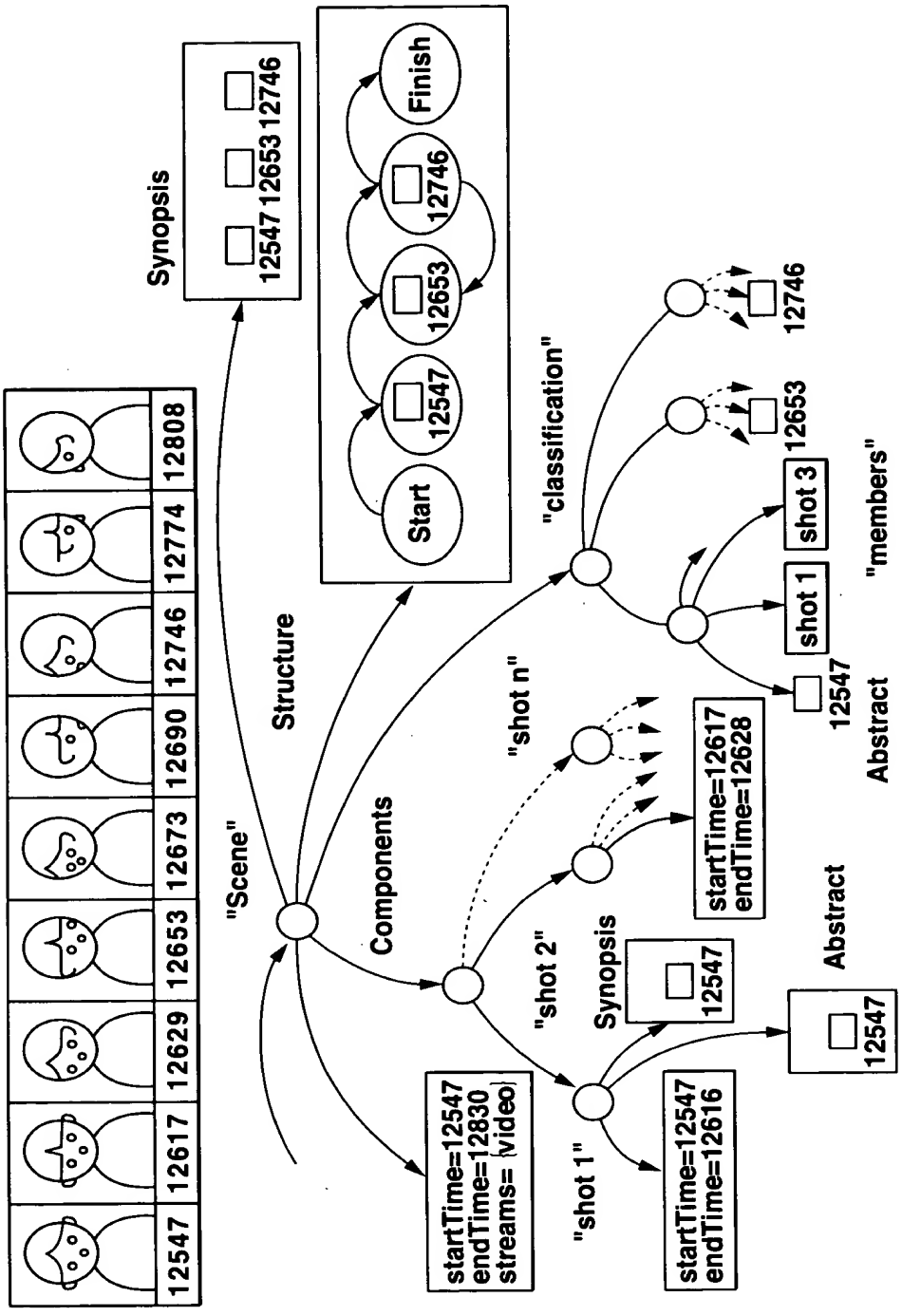
12547
12617
12629
12653
12673
12690
12746
12774
12808
"Scene"
Structure
Components
Synopsis
12547 12653 12746
Start
12547
12653
12746
Finish
"classification"
"shot n"
"shot 2"
"shot 1"
Synopsis
12547
Abstract
12547
startTime=12547
endTime=12830
streams= {video}
startTime=12617
endTime=12628
startTime=12547
endTime=12616
shot 1
shot 3
12653
12746
12547
Abstract
"members"

FIG.38

```
<scene>
        <startPoint>12547</startPoint>                  ;AVSegment
        <endPoint>12830</endPoint>                      ;AVSegment
        <streams>{video}</streams>                      ;AVSegment
        <synopsis kind=KEY_FRAME>                       ;BrowsingNode
                <sequence>
                        < KEY_FRAME refid= KEY_FRAME 1>
                        < KEY_FRAME refid= KEY_FRAME 2>
                        < KEY_FRAME refid= KEY_FRAME 3>
                </sequence>
        </synopsis>
        <abstract>                                      ;AVSegment
                <signature kind=SHOT_SIGNATURE>
                        <members>
                                <shot refid=shot1> <shot refid=shot2>
                                <shot refid=shot3>
                        </members>
                        <weights>0.1 0.45 0.45</weights>
                </signature>
        </abstract>
        <components>                            ;CompositeSegment
                <shot id=shot1                          ;Shot
                        <startPoint>12547</startPoint>  ;AVSegment
                        <endPoint>12616</endPoint>              ;AVSegment
                        <abstract>                              ;AVSegment
                                <signature kind=FRAME_SIGNATURE>
                                        <member><frame refid=12590></members>
                                        <weights>1.0</weights>
                                </signature>
                        </abstract>
                </shot>
                <shot id=shot2>
                        <startPoint>12617</startPoint>
                        <endPoint>12628</endPoint>
                        ...
                </shot>
                ...
                <shot id=shotn>...</shot>
        </components>
        <index>                                                 ;BrowsingNode
                <hierarchy kind=SHOT_INDEX>                     ;Hierarchy
                        <cluster id=cluster1>
                                <members>
                                <shot refid=shot2> <shot refid=shot4>...
                                </members>                      ;Cluster
                                </abstract>
                                        <prototype>shot 4</prototype>
                                </abstract>
                        </cluster>
                        <cluster id=cluster2>...</cluster>
                        <cluster id=cluster3>...</cluster>
                </hierarchy>
        </index>
        ...
        <structure>                                             ;BrowsingNode
                <avgraph kind=SHOT_GROUP>                       ;AVGraph
                        <avgraphedge source=start target=cluster1>
                        <avgraphedge source=cluster1 target=cluster2>
                        <avgraphedge source=cluster3 target=cluster2>
                        <avgraphedge source=cluster2 target=cluster3>
                        <avgraphedge source=cluster3 target=finish>
        </avgraph>
        <structure>
        ...
</scene>
```

FIG.39

09647265 : 110900